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A COMPARISON OF STUDENTS SCORING ABOVE THE EIGHTIETH PERCENTILE OR BELOW THE TWENTIETH PERCENTILE ON EITHER THE SCHOOL AND COLLEGE ABILITY TEST OR THE WATSON-GLASER TEST OF CRITICAL THINKING.

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IN ORDER TO ESTABLISH THE FEASIBILITY OF A CUT-OFF SCORE FOR ENTRANCE INTO TEACHER EDUCATION PROGRAMS AT NORTH TEXAS STATE UNIVERSITY, SCORES OF 1,346 STUDENTS WHO EITHER PLACED ABOVE THE 80TH PERCENTILE (N-672) OR BELOW THE 20TH PERCENTILE (N-674) ON EITHER THE SCHOOL AND COLLEGE ABILITY TEST OR THE WATSON-GLASER TEST OF CRITICAL THINKING WERE COMPARED WITH THEIR ACADEMIC RECORDS. PARTICULAR EMPHASIS WAS PLACED ON THE SCORES OF THE 164 TEACHER EDUCATION MAJORS WHO WERE INCLUDED IN THE STUDY. IT WAS FOUND THAT (A) MATHEMATICS MAJORS PERFORMED BEST ON THE TESTS--58.62 PERCENT SCORING ABOVE THE 80TH PERCENTILE AND ONLY 1.72 PERCENT BELOW THE 20TH, (B) FEMALES SCORED BELOW MALES BUT MADE HIGHER GRADES IN EDUCATION AND HAD HIGHER OVERALL ACADEMIC AVERAGES, (C) ELEMENTARY EDUCATION STUDENTS MADE LOWER SCORES ON THE TWO TESTS THAN DID SECONDARY EDUCATION STUDENTS BUT EARNED HIGHER GRADES IN EDUCATION COURSES AND HAD HIGHER OVERALL ACADEMIC AVERAGES, (D) JUNIOR COLLEGE TRANSFEREES SCORED BELOW STUDENTS WHO TOOK ALL THEIR WORK AT NORTH TEXAS STATE AND ALSO HAD LOWER GRADES AND LOWER OVERALL ACADEMIC AVERAGES, (E) THERE WAS LITTLE RELATIONSHIP BETWEEN THE SCORES MADE ON THE TESTS AND GRADES MADE IN THE STUDENT'S MAJOR. IT IS CONCLUDED THAT THE 20TH PERCENTILE ON EITHER TEST SHOULD NOT BE USED AS A CUT-OFF POINT SINCE THE GRADE POINT AVERAGE OF THOSE WHO SCORED BELOW THIS FIGURE ON THE SCAT WAS 1.66 AND 1.67 ON THE WATSON-GLASER. (AW)

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Denton, Texas

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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A COMPARISON OF STUDENTS SCORING ABOVE THE EIGHTIETH PERCENTILE OR BELOW THE TWENTIETH PERCENTILE ON EITHER THE SCHOOL AND COLLEGE ABILITY TEST OR THE WATSON-GLASER TEST OF CRITICAL THINKING

When the formal program of admission to the teacher education program was initiated at North Texas State University in 1963, one phase of the admission procedure was the administration of a battery of tests. The tests chosen were the SCAT and the Watson-Glaser plus a personality test which has been changed from time to time. The two tests have been administered to approximately 4,000 students during the past four years.

In September, 1967, a check was made of the records maintained in the admissions office to locate all students who had scored above the 80th percentile on either test or below the 20th percentile on either test. After locating the names and scores made by these subjects, the students' records in the Registrar's Office were obtained to gather additional data.

Any students whose records were not complete were eliminated from the study. There were 428 students who were thus not used in the analysis of the data. Some of these were accounted for in that they had probably married and could not be located. Others had dropped out of school before completing an additional term. In several instances, it was impossible to include a student because he had not taken additional work in his teaching field. There were 122 students who were below the 20th percentile on the Watson-Glaser who could not be included. Fifty-one were above the 80th percentile but excluded. On the SCAT there were 108 above the 80th percentile and 78 below the 20th percentile who were not included.

A tabulation was made by areas of those who scored above the 80th percentile or below the 20th percentile on the SCAT. These data are presented in Table I.

TABLE I

NUMBER AND PERCENT OF STUDENTS SCORING ABOVE THE 80TH PERCENTILE OR BELOW THE 20TH PERCENTILE ON THE SCAT

	Total Number	Below 20th N	Below 20th %	Above 80th N	Above 80th %
Elementary Majors	421	115	27.31	49	11.63
Social Studies	183	23	12.56	60	32.78
Physical Education	114	39	34.21	5	4.38
Industrial Arts	63	19	30.15	7	11.11
Speech-Drama	40	8	20.00	7	17.50
Home Economics	59	11	18.64	6	10.16
English	196	15	7.65	80	40.81
Science	36	2	5.55	19	52.77
Foreign Language	43	5	11.62	14	32.55
Music	115	21	18.26	32	27.82
Business	81	10	12.34	17	20.98
Mathematics	58	1	1.72	34	58.62
Art	54	16	29.62	5	9.25
North Texas Students	767	139	18.12	186	24.25
Transfer-Sr. College	375	55	14.66	89	23.73
Transfer-Jr. College	339	95	20.02	62	18.28
	2943	474		672	

An examination of Table I will show that of the 421 elementary majors included in this study, 27.31 per cent were below the 20th percentile and 11.63 per cent were above the 80th percentile on the SCAT. The vast majority were naturally between the 80th and the 20th. The norms used were national, and it seems fairly apparent that many more than 49 should have been above the 80th percentile out of many hundreds who have taken the tests.

Of the subject areas covered in this study, mathematics majors had the largest percentage (58.62) in the top 20 per cent. Only one mathematics major was in the bottom 20 per cent. Science was close behind with 52.77 per cent above 80th and 5.55 per cent below the 20th.

The area with the smallest per cent above the 80th was physical education with 4.38 per cent. There had been only five physical education majors who had been in the top twenty per cent. Art, home economics, and industrial arts were the other areas with a small per cent above the 80th percentile. One would expect approximately 20 per cent to fall at either end of the scale.

A similar tabulation was made for students who had attended North Texas since their college enrollment, those who had transferred from senior colleges and those transferring from junior colleges. A study of Table I will show that 28.02 per cent of the students who had transferred from a junior college and who were included in this study were below the 20th percentile in the SCAT while 18.28 per cent were above the 80th percentile. NTSU students were slightly higher with 14.66 per cent in the bottom one-fifth and 24.25 per cent in the top one-fifth. A slightly smaller per cent of the transfers from senior colleges were below the 20th (14.66) and also, fewer (23.73) were above the 80th. These data would seem to indicate that junior college students score lower on the SCAT than do transfer students from senior colleges or students who have been at NTSU for all of their program.

A similar tabulation was made for the results on the Watson-Glaser. The data are presented in Table II. From Table II, it becomes apparent that the students included in this study did not do as well as they did on the SCAT. No group had more than 30 per cent of its members above the 80th percentile. It might also appear that the subjects did better on

TABLE II

NUMBER AND PERCENT OF STUDENTS SCORING ABOVE THE 80TH PERCENTILE OR BELOW THE 20TH PERCENTILE ON THE WATSON-GLASER

	Total	Below 20th		Above 80th	
		N	%	N	%
Elementary	421	108	25.65	50	11.87
Social Studies	183	42	22.95	31	16.93
Physical Education	114	49	42.98	5	4.38
Industrial Arts	63	26	41.26	7	11.11
Speech-Drama	40	7	17.50	9	22.50
Home-Economics	59	19	32.20	6	10.16
English	196	30	15.30	42	21.42
Science	36	6	16.67	4	11.11
Foreign language	43	9	20.93	4	9.30
Music	115	24	20.86	19	16.52
Business	81	16	19.75	15	18.51
Mathematics	58	8	13.79	17	29.31
Art	54	14	25.92	5	9.25
North Texas Students	767	164	14.60	112	14.60
Transfer-Sr. College	375	87	23.20	66	17.60
Transfer-Jr. College	339	109	32.15	39	11.50

skill tests situations such as are found in the SCAT than they did with the "thinking"problems of which the Watson-Glaser is composed.

Junior college transfers did not do as well on this test as did either transfers from senior colleges or students who had been enrolled only at North Texas.

There were 563 students remaining in the study who were on the opposite ends of the scale in the SCAT. These data are presented in Table III.

TABLE III

MEANS, STANDARD DEVIATIONS, AND FISHER t FOR STUDENTS ABOVE THE 80TH PERCENTILE OR BELOW THE 20TH PERCENTILE ON THE SCAT

	Above 80th N = 311		Below 20th N = 252		
	M	σ	M	σ	t
Watson Glaser	77.34	7.00	63.08	8.67	21.55
Total Hours N.T.	44.94	17.49	41.73	15.97	2.59
Grade Points	96.45	43.93	70.44	33.31	7.75
G.P.A.	2.13	.51	1.66	.41	11.90
Hours 1st Field	35.00	16.29	31.98	16.53	2.16
Grade Points	75.61	45.24	53.71	34.96	6.30
G.P.A.	2.13	.56	1.63	.51	10.81
Hours Education	16.02	8.28	17.94	9.37	- 2.57
Grade Points	37.20	21.58	33.37	21.17	2.11
G.P.A.	2.27	.52	1.80	.76	8.79

A study of Table III will show that students who were below the 20th percentile on the SCAT had significantly lower scores on the Watson-Glaser, significantly lower grade point average on work taken at North Texas, significantly lower grade point average in first teaching field and a significantly lower average in education. The only area in which the difference was in favor of the lower group was in the number of hours taken in education. The lower group had taken an average of 1.92 more hours of education than had those above the 80th percentile.

While there was a highly significant difference in each instance, it should be pointed out that the students who scored below the 20th percentile on the SCAT still maintained a G.P.A. of 1.66 on all work attempted, an average of 1.63 in the first teaching field and 1.80 in education. It seems quite obvious that the 20th percentile cannot be used as a cut-off point on the SCAT if academic grades are a criteria of success.

Data relative to those above the 80th percentile or below the 20th percentile on the Watson-Glaser are presented in Table IV.

TABLE IV

MEANS, STANDARD DEVIATIONS, AND FISHER t FOR STUDENTS ABOVE THE 80TH PERCENTILE OR BELOW THE 20TH PERCENTILE ON THE WATSON-GLASER

	Above 80th N = 179		Below 20th N = 314		
	M	σ	M	σ	t
SCAT	62.46	12.02	38.83	10.48	22.74
Total Hrs. NT	39.03	15.70	43.71	16.53	-3.07
Grade Points	83.41	40.62	74.47	35.11	2.56
GPA	2.11	.50	1.67	.44	10.19
Hours 1st Field	33.13	17.13	33.77	16.08	- .41
Grade Points	67.40	42.47	57.36	34.93	2.83
GPA	2.01	.57	1.66	.51	7.00
Hours - Educ.	14.91	8.83	17.03	9.16	-2.50
Grade Points	34.49	21.91	32.63	21.56	.91
GPA	2.29	.53	1.83	.73	7.29

A study of Table IV will reveal that students who scored low on the Watson-Glaser also scored low on the SCAT. The difference in means was highly significant. Students below the 20th percentile had taken more hours than those above the 80th percentile and had received grades which were significantly lower. The low group had also taken more hours in their first teaching field but received lower grades. The difference was significant at better than .01. The same situation held for education where the students below the 20th percentile had completed an average of 17.03 hours with a G.P.A. of 1.83 while those above the 80th percentile had completed an average of 14.91 hours with a G.P.A. of 2.29. As with the SCAT, students who scored below the 20th percentile still made quite respectable grades. The 20th percentile could not be used as a cut-off point on this test without eliminating students who can be successful.

Data relative to the performance of men and women is presented in Table V.

TABLE V

MEANS, STANDARD DEVIATIONS, AND FISHER t
FOR MALE AND FEMALE STUDENTS

	Female N = 1045		Male N = 439		
	M	σ	M	σ	t
SCAT	49.40	14.07	50.47	14.83	-1.32
Watson Glaser	70.96	9.12	69.20	10.00	3.29
Hours at NT	42.75	16.00	42.52	18.14	.24
Grade Points	84.29	38.71	75.74	41.01	3.81
G.P.A.	1.96	.48	1.74	.57	5.56
Hours 1st Field	30.99	15.13	39.72	16.76	-9.82
Grade Points	58.65	37.85	73.99	41.36	-6.92
G.P.A.	1.84	.58	1.83	.53	.49
Hours Education	17.18	9.38	14.98	7.77	4.31
Grade Points	37.18	22.42	28.72	18.43	6.97
G.P.A.	2.13	.51	1.84	.71	8.91

Several interesting items are apparent in Table V. The entire group of students (1,484) were included. The heavy concentration of females was probably caused by the number of women in elementary education. On the SCAT, the males scored slightly higher but the difference was not significant. On the Watson Glaser, the females scored 1.76 points above the males, and while this difference was not great it was significant at better than the .01 level. Each group had completed slightly over 42 hours of work since enrolling in their first education course. The females had made a grade point average of 1.96 which was .22 above the mean for the males. On the North Texas grading scale this represented approximately one-fourth of a letter grade, and the difference was highly significant in favor of the females.

When comparing hours completed and grade points in the first teaching field, the males had completed more hours and gained more grade points. The differences here were highly significant, but the grade point average was almost identical for the two groups. The females had completed 17.18 hours in education while the males had completed 14.98. This difference in favor of the females was significant at better than the .01 level. The grade points and the grade point average was also in favor of the females with the difference in average of .29 attaining significance beyond the .001 level. One might conclude that the higher over-all grade point average of the females could in large measure be attributed to their having taken more hours of education and attaining a high grade point average in this field. Men, on the other hand, had almost the same g.p.a. in education as in their first teaching field.

The group was then divided on the basis of elementary or secondary level of preparation. The data are presented in Table VI.

TABLE VI

MEANS, STANDARD DEVIATIONS, AND FISHER t FOR ELEMENTARY AND SECONDARY PREPARATION LEVELS

	Elementary N = 540		Secondary N = 942		
	M	σ	M	σ	t
SCAT	46.07	13.33	51.78	14.44	- 7.53
Watson-Glaser	69.77	9.30	70.80	9.48	- 2.04
Hours at N.T.	42.72	16.30	42.66	16.87	.07
Grade Points	83.81	38.80	80.58	39.99	1.51
G.P.A.	1.94	.45	1.87	.55	2.57
Hours in 1st Field	26.49	16.14	37.64	14.66	-13.56
Grade Points	47.93	39.25	71.95	37.01	-11.76
G.P.A.	1.73	.56	1.90	.56	- 5.44
Hours in Educ.	20.92	10.21	14.02	7.07	15.31
Grade Points	44.76	24.94	28.91	17.03	14.47
G.P.A.	2.09	.48	2.02	.65	2.01

A study of Table VI reveals that the secondary group achieved a mean score on the SCAT which was 5.71 points above the mean for the elementary group. This difference was significant at better than the .01 level. The difference of 1.03 on the Watson Glaser in favor of the secondary group

was significant at better than the .05 level. There was no significant difference in the number of hours completed since enrollment in the first education course, but the higher grade point average of .07 in favor of the elementary group was significant at just less than the .01 level.

Secondary majors had completed an average of 11.15 more hours in their first teaching field and had attained a mean of 1.90 which was .17 more than the elementary group. The difference was significant beyond the .01 level.

In education, the elementary group had completed a mean of 20.92 hours which was 6.90 hours more than the secondary group. This difference was significant beyond the .01 level. The elementary group had attained a grade point average in education which was .07 greater than the secondary group. This difference while small was significant at the .05 level.

These data would seem to indicate that the elementary group took more hours of education and made considerably better grades in education than in their area of specialization. Their over-all grade point average was also better than in their area of specialization. One should point out that the grade in the area of specialization would approach a "B" while in education the grade would be slightly above a "B". The secondary group also made better grades in education than in the first teaching field which was better than their over-all average. The average grade of this secondary group would be slightly less than a "B".

One of the areas of concern was to know how the students who had attended North Texas throughout their career would compare with transfer students. Information comparing North Texas students with transfers from Texas senior colleges is presented in Table VII.

TABLE VII

MEANS, STANDARD DEVIATIONS, AND FISHER t FOR NORTH TEXAS STUDENTS AND TRANSFERS FROM TEXAS SENIOR COLLEGES

	North Texas N = 766		Transfer - TSC N = 376		
	M	σ	M	σ	t
SCAT	50.33	14.02	51.64	14.35	-1.47
Watson Glaser	70.90	8.75	71.33	9.84	- .72
Hours at N.T.	44.29	16.65	40.65	16.35	3.49
Grade Points	86.21	40.24	78.28	37.98	3.20
G.P.A.	1.93	.54	1.91	.46	.68
Hours 1st field	33.97	16.07	32.87	15.73	1.09
Grade Points	64.80	39.89	60.80	38.16	1.60
G.P.A.	1.87	.58	1.80	.54	1.81
Hours in Educ.	16.89	8.91	16.58	9.14	.55
Grade Points	35.93	21.57	35.02	22.11	.67
G.P.A.	2.09	.61	2.05	.52	1.23

A study of Table VII will show that students who transferred to North Texas from other senior colleges in Texas achieve slightly higher scores on both the SCAT and Watson Glaser than do student who have taken all their work at North Texas. This difference in mean score was not significant on either test. North Texas students made slightly high grade point averages on all work, in the first teaching field and in education. These differences were small and were non-significant. These data would seem to indicate

that students who transfer to North Texas from other senior colleges are on a par with North Texas students on each measure studied.

Information comparing students who had transferred from Texas Junior Colleges with students who had taken all of their work at North Texas is presented in Table VIII.

TABLE VIII

MEANS, STANDARD DEVIATIONS, AND FISHER t FOR NORTH TEXAS STATE STUDENTS AND TRANSFERS FROM TEXAS JUNIOR COLLEGES

	North Texas N = 766		Junior College N = 340		
	M	σ	M	σ	t
SCAT	50.33	14.02	46.13	14.27	4.55
Watson Glaser	70.90	8.75	68.38	10.10	4.14
Hours at N.T.	44.29	16.65	41.36	16.59	2.71
Grade Points	86.21	40.24	75.78	38.63	4.07
G.P.A.	1.93	.54	1.80	.50	3.93
Hours 1st Field	33.97	16.07	33.51	16.67	.44
Grade Points	64.80	39.89	62.49	40.04	.90
G.P.A.	1.87	.58	1.83	.54	1.03
Hours-Educ.	16.89	8.91	15.65	8.91	2.12
Grade Points	35.93	21.57	31.48	21.00	3.17
G.P.A.	2.09	.61	1.95	.61	3.77

An examination of Table VIII will show that students who have attended North Texas throughout their college career made a mean score on the SCAT which was 4.20 points higher than that made by transfers from junior colleges. This difference was significant at better than the .01 level. The difference of 2.52 points on the Watson Glaser in favor of the North Texas students was also significant at better than the .01 level. These data would seem to indicate that students who started their college work at North Texas score significantly higher on each of these measures than do students who transfer from junior colleges.

When one examines the relative standings as measured by grade point average it becomes obvious that North Texas students obtain a higher over-all grade point average and a higher mean grade point in education. In each case the differences were significant at better than the .01 level. In the first teaching field the difference was only .04 in favor of the North Texas students, but this difference was not significant.

As with the SCAT and the Watson Glaser it would appear that students who have transferred to North Texas made a significantly lower grade point average in education and over-all than do students who had attended North Texas for their entire program. Students who had been at North Texas also made higher mean grades in their first teaching field, but this difference was not significant.

Approximately one-half of the students involved in the study had already completed their program so a comparison was made with those currently enrolled. This information is presented in Table IX.

A study of the data in Table IX would show that students who have completed their program made a mean score on the SCAT which was only slightly higher than that made by those currently enrolled. Students currently enrolled made a mean score which was 1.81 points above the score made by those who have completed their program. This difference was highly significant.

TABLE IX

MEANS, STANDARD DEVIATIONS, AND FISHER t FOR STUDENTS WHO HAVE COMPLETED THE PROGRAM AND FOR THOSE CURRENTLY ENROLLED

	Completed N = 624		Currently Enrolled N = 629		
	M	σ	M	σ	t
SCAT	50.43	14.74	49.64	13.81	.97
Watson Glaser	69.60	9.00	71.41	9.26	-3.48
Hours-N.T.	53.00	12.57	37.73	14.00	19.65
Grade Points	104.77	34.36	71.63	33.85	17.52
G.P.A.	1.98	.45	1.88	.48	3.80
Hours-1st field	36.40	16.59	32.74	15.55	4.06
Grade Points	68.74	41.86	63.09	38.06	2.55
G.P.A.	1.84	.55	1.89	.57	-1.72
Hours-Education	22.82	7.91	12.69	6.16	25.08
Grade Points	49.33	20.29	26.12	15.15	23.40
G.P.A.	2.15	.45	2.04	.67	3.26

Students who have completed their program made a mean over-all grade point average which was .10 above that made by those currently

enrolled. This difference while small was significant. It is interesting to note that students who were currently enrolled made a slightly higher mean grade point in the first teaching field. This difference was not significant. Those who had completed had a mean grade point in education which was .11 greater than the mean of those currently enrolled. This difference was significant at better than the .01 level.

It was felt that some comparison between subject areas would be of value. These data for elementary majors and majors in Social Studies, Physical Education, and I.A. are printed in Table X.

TABLE X

MEANS, STANDARD DEVIATIONS, AND FISHER t COMPARING ELEMENTARY MAJORS, WITH SOCIAL STUDIES, PHYSICAL EDUCATION, AND INDUSTRIAL ARTS

	Elementary N = 421		Social Studies N = 183			P. E. N = 114			I. A. N = 63		
	M	σ	M	σ	t	M	σ	t	M	σ	t
SCAT	45.59	12.86	52.80	14.50	- 6.15	41.59	10.32	- 2.87	44.70	12.46	..50
Watson Glaser	69.65	9.24	71.09	10.51	- 1.75	66.35	8.43	3.38	67.40	10.69	1.80
Hours-N.T.	42.56	16.22	42.48	16.36	.05	44.16	18.07	- .91	38.22	15.32	1.93
Grade Points	84.29	38.49	75.42	35.43	2.55	77.39	39.49	1.66	69.44	35.12	2.80
G.P.A.	1.95	.46	1.77	.50	4.16	1.72	.44	4.44	1.77	.50	2.69
Hours 1st Field	21.18	6.77	32.61	12.57	-12.03	38.18	8.49	-15.01	47.56	9.57	-18.19
Grade Points	35.36	17.35	53.65	26.25	- 7.29	78.67	21.76	-14.48	95.24	27.73	-15.64
G.P.A.	1.66	.55	1.65	.58	.15	2.08	.41	- 7.42	2.02	.46	- 4.96
Hours-Educ.	22.19	10.14	14.92	7.48	10.10	13.23	6.23	10.44	16.00	5.95	5.64
Grade Points	47.91	24.76	30.38	17.16	10.06	23.77	14.31	11.61	29.38	13.56	6.97
G.P.A.	2.12	.47	2.00	.53	2.29	1.72	.50	6.58	1.79	.53	4.28

A study of Table X will show that the elementary majors made significantly lower scores on the SCAT that did majors in social studies. The difference on this test was not significant. The elementary majors had a significantly higher grade point average on all work and in education, but there was no significant difference in the grade point average in the first field.

Elementary majors scored 4.00 points higher on the SCAT that did P. E. majors and 3.30 points higher on the Watson-Glaser. Both of these differences were highly significant. Elementary majors also made significantly higher grade point averages on all work attempted and in their teaching field. Physical education majors had completed considerably more hours in their field.

When comparison was made of elementary majors and industrial arts majors, it was found that elementary majors made higher scores on both the SCAT and the Watson-Glaser, but these differences were not significant. Elementary majors made significantly higher grade point averages on all work attempted and in education, but industrial arts majors made significantly higher scores in their major. Industrial arts majors had also completed more than twice as many hours in their major as had elementary majors.

It is interesting to note that elementary majors made a higher mean score in education than any of the other groups. In each instance this difference was significant. Mean grade points were directly reversed from the scores obtained on the SCAT and Watson-Glaser. Physical education majors made the lowest scores on these tests, but received the higher grades. Industrial arts majors were next lowest in the tests but second highest on grades. Social studies majors were highest on the tests and made the lowest grades.

Comparisons between elementary majors and majors in speech and drama, home economics, and music are found in Table XI.

TABLE XI
MEANS, STANDARD DEVIATIONS, AND FISHER t FOR
ELEMENTARY MAJORS, SPEECH AND DRAMA,
HOME ECONOMICS AND MUSIC

	Elementary N = 421		Speech and Drama N = 40			Home Economics N = 59			Music N = 115		
	M	σ	M	σ	t	M	σ	t	M	σ	t
SCAT	45.59	12.86	48.98	12.79	-1.55	45.46	11.89	.07	51.67	15.12	- 4.37
Watson Glaser	69.65	9.24	72.98	8.67	-2.17	68.80	9.34	.66	71.25	8.87	- 1.64
Hours - N.T.	42.56	16.22	43.08	17.97	- .19	39.46	11.89	1.34	44.71	17.36	- 1.23
Grade Points	84.29	38.49	78.05	41.43	.96	70.56	31.05	2.52	87.28	43.48	- .72
G.P.A.	1.95	.46	1.75	.57	2.46	1.76	.49	2.65	1.93	.43	.51
Hours 1st Field	21.18	6.77	33.25	8.05	-6.80	53.41	8.67	-21.60	61.94	21.11	-36.09
Grade Points	35.36	17.35	66.23	22.34	-6.58	96.61	31.39	-15.55	134.96	58.27	-33.40
G.P.A.	1.66	.55	2.00	.50	-3.85	1.80	.48	-1.93	2.17	.46	- 9.09
Hours- Educ.	22.19	10.14	14.40	6.91	5.79	8.03	3.56	12.53	14.05	7.31	9.52
Grade Points	47.91	24.76	29.80	18.03	5.56	15.31	7.84	11.91	27.92	18.91	9.65
G.P.A.	2.12	.47	1.99	.69	1.38	1.89	.51	2.89	1.95	.99	2.82

A study of Table XI will show that elementary majors and home economics majors made approximately the same score on the SCAT and the Watson-Glaser. The slight difference in favor of the elementary majors

was not significant on either test. Elementary majors made average grades which were significantly higher than the home economics majors on all work and significantly lower grades in the major but reversed this to attain a significantly higher grade in education.

Majors in speech and drama scored significantly higher on the Watson-Glaser than did elementary majors and also higher on the SCAT but this difference was not significant. Elementary majors achieved a mean grade point on all work attempted which was .20 higher than speech and drama majors. This difference was significant at better than the .05 level. In the major, the speech and drama students attained significantly higher mean grades than did elementary in their specialization area. Elementary majors made a higher mean grade in education, but the difference was not significant.

Music majors scored significantly higher than elementary majors on the SCAT and somewhat higher on the Watson-Glaser, but the difference here was not significant. The two groups achieved almost identical grade point averages overall, but the music majors made significantly higher grades in their major than elementary made in their specialization. Elementary majors made significantly higher grades in education than did music majors.

As in prior comparisons, elementary majors made higher grades in educatinn and lower grades in the specialized area. Most of these differences were significant.

Comparisons between elementary majors and majors in English, science, and foreign language are made in Table XII.

TABLE XII

MEANS, STANDARD DEVIATIONS, AND FISHER t FOR ELEMENTARY MAJORS ENGLISH, SCIENCE, AND FOREIGN LANGUAGE

	Elementary N = 421		English N = 196			Science N = 36			Foreign Language N = 43		
	M	σ	M	σ	t	M	σ	t	M	σ	
SCAT	45.59	12.86	56.02	13.34	-9.12	58.97	15.24	-5.83	55.23	12.12	-4.55
Watson Glaser	69.65	9.24	72.92	8.34	-4.09	70.94	8.53	- .81	70.19	9.24	- .36
Hours-N.T.	42.56	16.22	44.02	17.88	-1.02	39.11	18.51	1.19	38.93	15.08	1.36
Grade Points	84.29	38.49	88.45	41.40	-1.22	76.33	45.40	1.17	85.67	43.98	- .22
G.P.A.	1.95	.46	2.03	.64	-1.65	1.88	.55	.81	2.12	.53	-2.07
Hours-1st Field	21.18	6.77	29.51	7.27	-8.97	33.17	16.04	-6.43	26.67	5.94	-3.20
Grade Points	35.36	17.35	57.52	23.16	-9.04	60.58	35.74	-5.13	60.56	20.05	-5.55
G.P.A.	1.66	.55	1.93	.56	-5.90	1.80	.58	-1.48	2.27	.56	-7.15
Hours-Educ.	22.19	10.14	14.72	7.27	10.62	15.08	8.05	5.04	12.07	5.95	7.78
Grade Points	47.91	24.76	32.39	17.47	9.12	32.47	20.55	4.52	27.14	14.50	6.59
G.P.A.	2.12	.47	2.22	.57	-1.90	2.05	.54	.69	2.22	.66	-1.08

An examination of Table XII will reveal that elementary majors scored significantly lower on the SCAT than any of the other three groups, but not significnatly lower than the science and foreign language groups in the Watson-Glaser. English majors scored 3.27 points above the elementary majors on the Watson-Glaser. This difference was significant at better than the .01 level. On all work attempted, English majors scored higher

than elementary majors, but the difference was not significant. Foreign language majors also scored higher than elementary majors and this difference was significant at the .05 level. Each of the other majors received higher grades in their major that did elementary majors in their specialization area. This difference was significant for English and foreign language majors but not significant for science majors.

In education, English and foreign language majors received slightly higher mean grades while science majors were lower than elementary majors. None of these differences was significant.

Data regarding elementary majors, business majors, mathematics majors and art majors are contained in Table XIII. A study of Table XIII will show that elementary majors made slightly higher scores on the SCAT and Watson-Glaser than did art majors. The differences were not significant. Business majors scored slightly higher, but the difference was not significant. On over-all grade point average the elementary majors made a higher mean grade point than any of the three groups. The difference between elementary majors and art majors was significant in favor of the elementary majors. Each of the three majors made a higher mean grade point in their first teaching field than elementary majors made in their area of specialization. The difference was significant for mathematics majors. Elementary majors made slightly higher grades in education than did mathematics or art majors, but slightly lower than business majors. The differences were not significant.

TABLE XIII

MEANS, STANDARD DEVIATIONS, AND FISHER t FOR ELEMENTARY MAJORS, BUSINESS MAJORS, MATHEMATICS MAJORS AND ART MAJORS

	Elementary N = 421		Business N = 81			Mathematics N = 58			ART N = 54		
	M	σ	M	σ	t	M	σ	t	M	σ	t
SCAT	45.59	12.86	50.23	12.59	- 2.89	64.93	13.59	-10.44	45.00	13.85	.31
Watson Glaser	69.65	9.24	71.68	8.26	- 1.81	74.67	9.85	- 3.87	68.50	9.01	.86
Hours- N.T.	42.56	16.22	42.51	15.03	.02	46.62	17.51	- 1.75	39.48	14.47	1.28
Grade Points	84.29	38.49	80.23	33.91	.85	90.17	42.34	- 1.07	72.50	37.83	2.08
G.P.A.	1.95	.46	1.88	.56	1.17	1.90	.49	.78	1.80	.47	2.07
Hours- 1st Field	21.18	6.77	46.85	12.41	-19.71	29.86	7.50	- 5.78	32.11	14.04	-7.05
Grade Points	35.36	17.35	83.51	35.44	-14.00	54.50	21.36	- 4.82	155.83	29.38	-5.00
G.P.A.	1.66	.55	1.77	.57	- 1.66	1.82	.51	- 2.08	1.74	.44	-1.01
Hours- Educ.	22.19	10 14	13.93	6.24	8.38	16.60	9.00	4.91	16.50	9.43	4.84
Grade Points	47.91	24.76	31.04	16.41	7.07	35.59	21.14	4.47	34.04	21.83	4.88
G.P.A.	2.12	.47	2.17	.53	- .65	2.11	.51	.10	2.02	.50	1.23

CONCLUSIONS

The results of this study led to the following conclusions:

1. It would be undesirable to establish the 20th percentile as a cut-off point on either the SCAT or Watson-Glaser. The grade point average of all those below the 20th percentile on the SCAT was 1.66.